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The introduction of this work provides a summary of the background that led to the establishment of the joint enterprise. Despite joint operations and joint logistics having evolved during campaigns in World War II and Operation IRAQI FREEDOM, the integration of operations and logistics planning has lagged behind. Chapter 2 draws on the analysis of research to highlight how to integrate methodology essentials for joint operations and joint logistics. Chapter 3 identifies the Defense Logistics Agency and U.S. Transportation Command as essential joint logistics components and highlights their capability to support operations and logistics planners. Chapter 4 provides conclusions by reflecting on the analysis of integration failures during World War II and IRAQI FREEDOM and incorporates how integration can better serve the joint force in the future.

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NATIONAL DEFENSE UNIVERSITY

JOINT FORCES STAFF COLLEGE

JOINT ADVANCED WARFIGHTING SCHOOL

LOGISTICS INTEGRATION: CLOSING THE GAP

by

Keith A. Capper

Lieutenant Commander, U.S. Navy

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes.

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ABSTRACT

Far too often well intentioned operational plans are built on unrealistic assumptions of the logistics infrastructure. Often times the joint logistics planner does not understand the interconnection of operational requirements and logistics requirements. Joint logistic planning requirements must effectively integrate with joint operational planning requirements to achieve future objectives.

The introduction of this work provides a summary of the background that led to the establishment of the joint enterprise. Despite joint operations and joint logistics having evolved during campaigns in World War II and Operation IRAQI FREEDOM, the integration of operations and logistics planning has lagged behind. Research has been conducted to demonstrate specific disconnects in planning in 1944, and again in 2003, to make the case that operations and logistics integration need to be improved. Chapter 2 draws on the analysis of research to highlight how to integrate methodology essentials for joint operations and joint logistics. An examination of the current doctrine for logistics and operations provides the framework for how joint operations and joint logisticians can integrate via doctrine today. Chapter 3 identifies the Defense Logistics Agency and U.S. Transportation Command as essential joint logistics components and highlights their capability to support operations and logistics planners. Credit is given for their contributions and ability to support operational and logistics planning integration. Chapter 4 provides conclusions by reflecting on the analysis of integration failures during World War II and Iraqi Freedom and incorporates how integration can better serve the joint force in the future.

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DEDICATION

To my wife and children:

You are my inspiration to
complete what would have
never of been conceivably
possible without your love
and support. Throughout
thick and thin as well as the
trials and tribulations you
continue to stand beside me
for reasons that are often hard
to believe or comprehend.
Thank you!

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INTRODUCTION

"I don't know what the hell this 'logistics' is that Marshall is always talking about, but I want some of it."

Admiral E. J. King[1]

"As we select our forces and plan our operations,....we must understand how logistics can impact our concepts of operation. . . . Commanders must base all their concepts of operations on what they know they can do logistically."

Lt Gen Alfred M. Gray, Jr., USMC[2]

Joint logistic planning requirements must effectively integrate with joint operational planning requirements to achieve clearly defined objectives. The description of joint logistics is found in Joint Publication 4-0: "Joint logistics . . . ensures forces are physically available and properly equipped, at the right place and time, to support the joint force."[3] Logistics, as described by William G. Pagonis in his book, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War,* is "the careful integration of transportation, supply, warehousing, maintenance, procurement, contracting, and automation into a coherent functional area . . . in a way that permits and enhances the accomplishment of a given goal, objective, or mission."[4]

Pagonis describes a logistician as someone who only works within a limited set of constants, variables, and constraints. It is true that logisticians use this knowledge to eliminate unknowns, one by one, until they are satisfied that they have mitigated the risks to the plan and avoided the possibility of surprises. By eliminating unknowns, logisticians are

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[1] Matthew D. Cox, "Logistics: Logistics Quotations," The WWW Virtual Library, http://www.logisticsworld.com/logistics/quotations.htm (accessed October 5, 2011)

[2] Ibid.

[3] U.S. Joint Chiefs of Staff, *Joint Logistics*, Joint Publication 4-0 (Washington DC: Joint Chiefs of Staff, July 18, 2008), vii.

[4] William G. Pagonis and Jeffrey L. Cruikshank, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War* (Boston, MA: Harvard Business School Press, 1992), 2.

able to provide joint force commanders with the means to utilize all the tools available to accomplish specific operational objectives. Yet, these skills must be applied with a thorough and complete understanding of the operational plan – essentially how that plan was assembled.

How can the joint logistics planner and the joint operational planner integrate to achieve these objectives? It is a question that has plagued operational level planners since World War II. The evidence of over sixty years of joint operations suggests that, while operational planners and logistic planners have become more proficient, the integration of their two disciplines is not evolving at the same pace. Critical disconnects between operational and logistical planning that were evident during World War II were also apparent as late as 2003 during the opening actions of Operation IRAQI FREEDOM (OIF). Integration is hampered because, quite often, the joint operational planner does not appreciate logistics as it pertains to planning and conversely, the joint logistics planner does not understand the larger operational issues derived from the planning process. This problem is primarily a result of unintentional overlapping initiatives to support the end state as a derivative of the planning roles and responsibilities in mission execution.

According to Joint Publication 5-0 "It [joint operation planning] transforms national strategic objectives into activities by development of operational products that include planning for the mobilization, deployment, employment, sustainment, redeployment, and demobilization of joint forces."[5] But sustainment, redeployment, and demobilization is often left only to the logistics planner. According to Joint Publication 4-0, "the challenge of

[5] U.S. Joint Chiefs of Staff, *Joint Operation Planning*, Joint Publication 5-0 (Washington DC: Joint Chiefs of Staff, August 11, 2011), I-1.

logisticians is to link strategic resources to tactical unit requirements."[6] The joint operational planner represents the person, people, or entity in charge of determining the requirements of the joint force. The joint logistics planner is in charge of fulfilling needs to meet the desired requirements of the joint operational planner, and providing support to meet the commander's intent.

Historical evidence throughout this thesis will illustrate circumstances where the operational planner inadvertently did not consider logistics feasibility and where the logistics planning lacked understanding of the operational context that results in gaps of logistics support to operational plan. Thus, the logistical planner and operations planner are neither wholly dependent on, nor exclusively independent of, one another. Nevertheless, there must be significant understanding of the relationship between operational planning elements on behalf of the operational planning team by the logistics planning team. Similarly, logistic constraints and restraints that exist must be understood and considered from an operational planning perspective in order to effectively accomplish the planned mission.

An operational-logistics integration concept within joint doctrine that allows for planning challenges to be minimized is needed in order to gain the greatest operational effectiveness and eliminate recurring problems in execution. This requires a collaborative effort early and often throughout the planning and execution phases. This codependency has been rediscovered throughout history. Unfortunately, this discovery is often realized during mission execution.

[6] Joint Publication 4-0, III-12.

There are significant consequences that affect the operational planner when logistic capabilities are not clearly understood as a result of poor assumptions. Past examples of disconnects in operational and logistical planning assumptions are evident in crucial areas such as fuel consumption, port availability, asset visibility, and force movement and onward integration. Collaboration implies that the logistics planner and the operational planner will integrate their views early in the planning process, throughout the execution of the planned mission, and ultimately through to mission completion.

The highest requirement of the Joint Force Commander is to have educated joint planners who have the skills and knowledge to understand and appreciate the operational and logistical planning requirements. Effective collaboration and integration are necessary to meet the commander's intent. While the idea of logistics may be simple, the execution of logistics in a joint campaign is far from simple, especially when a lack of operational and logistical planning integration is evident. A number of recommendations will be presented to modify joint logistics doctrine, along with specific recommended changes in the operational planning process. Both will highlight where and how the integration of logistics and operational planning must occur.

This thesis will focus on the need for integration of operations and logistics planning and will conclude with a recommended approach for operational and logistics planning integration. Historical examples from both OVERLORD and Operation IRAQI FREEDOM will be used to demonstrate common planning disconnects across more than sixty years, which suggest that integration is a problem yet to be solved. Recommended modifications to joint doctrine will be used as the means to overcome these disconnects.

The thesis will present a doctrinal critique of the current joint publications, illustrating where both Joint Publication 4-0 and Joint Publication 5-0 fail to make clear how logistics planners and operational planners should collaborate in the planning process. The gaps identified in this critique will be addressed in a revision of the joint operational planning process. This will be followed by a logistics planning methodology for supporting course of action development. A review of supporting components for logistics planning will compliment the doctrinal revisions.

CHAPTER 1: METHODOLOGY ESSENTIALS FOR JOINT OPERATIONS AND JOINT LOGISTICS PLANNING INTEGRATION

"There is no compensating for shortage of supplies."

Manfred Rommel[1]

The need for integration of the joint operations planner and the joint logistics planner has deep roots in American military history. What has been lacking is that there has been no logistics planning methodology that is comparable to an operational planning methodology. Joint Publication 4-0, *Joint Logistics*, acknowledges planning for joint logistic support that links operational objectives to core logistics capabilities, but does not articulate how those linkages are to occur. A planning methodology that complements the operational planning process is necessary to incorporate the ideas of the joint operational planner, with the expertise of the joint logistician to ensure the force is capable of maneuver and sustainment throughout the operation. A review of Joint Publication 5-0, *Joint Operation Planning,* and Joint Publication 4-0, *Joint Logistics,* makes it clear that the integration of concepts is important, but doctrine fails to articulate how this integration is to occur. This chapter will examine and assess how Joint Publication 4-0 approaches planning.

The Mission Planning Process in Joint Publication 5-0

Current joint doctrine has outlined the joint operations planning process (JOPP) as a means for a planning staff "to conduct detailed planning to fully develop options, identify resources, and identify and mitigate risk."[2] Joint Publication 5-0 describes JOPP as "an orderly, analytical process, which consists of a set of logical steps to examine a mission;

[1] Matthew D. Cox. "Logistics: Logistics Quotations," The WWW Virtual Library, http://www.logisticsworld.com/logistics/quotations.html (accessed October 5, 2011), 3.

[2] U.S. Joint Chiefs of Staff, *Joint Operation Planning,* Joint Publication 5-0 (Washington DC: Joint Chiefs of Staff, August 11, 2011), x.

develop, analyze, and compare alternative COAs; select the best COA; and produce a plan or order." JOPP is intended to facilitate interaction between the staff and helps them share a common understanding of the mission and commander's intent.[3] Joint Publication 5-0 states that as part of developing understanding and reducing uncertainty, "planners align actions and resources in time and space to complete the plan. In doing so, they should take into account the details of force requirements, force availability, task organization, and sustainment and deployment concepts."[4] Unfortunately, Joint Publication 5-0 fails to acknowledge the critical role logistical planners play in developing options, resources, and risk, and while acknowledging the importance of force requirement and sustainment, it fails to illustrate or explain how a common understanding occurs as part of JOPP. More importantly, the structure of JOPP lacks a specific process of collaboration between operational and logistical planners.

Logistics considerations are first addressed in the mission analysis process with the logistics staff estimate, which is part of the staff estimate step of mission analysis as depicted in figure IV-1 and figure IV-4 found in Joint Publication 5-0.[5] According to doctrine, the logistical planners should develop a logistics overview, which includes critical logistics assumptions and information requirements, host nation support issues, air and sea ports of debarkation, infrastructure analysis, stockage inventories, and known or potential capability shortfalls. This logistics overview lends itself to a logistics estimate "that identifies and addresses known and anticipated factors that may influence the feasibility of providing

[3] Ibid., xxv, IV-1.
[4] Ibid., I-5.
[5] Ibid., Fig IV-1 and Fig IV-4.

required logistics support."[6] This work is necessary, but all inputs into the logistics overview must be addressed far earlier in the mission analysis process. These components of the logistics overview and where they should be included in the mission analysis process will be examined in detail in a later chapter.

Joint Publication 4-0: The Approach to Planning

Joint Publication 4-0 describes joint logisticians as the planners, executors, and controllers of core joint logistic capabilities, who understand joint force requirements at the operational and strategic levels of war, and can synchronize efforts to meet those requirements.[7] The results of planning for joint logistic support link "the mission, commander's intent, and operational objectives to core logistic capabilities, procedures, and organizations. Joint logistic planning defines joint processes to establish an effective concept for logistic support."[8]

Joint Publication 4-0 presents an overview of the joint operational planning and describes the four planning functions: Strategic Guidance, Concept Development, Plan Development, and Plan Assessment. It discusses the importance of "frequent dialogue between senior leaders and commanders to promote a common understanding of planning assumptions, considerations, risks, COAs, implementing actions, and other key factors," but it has little to say about the planning process itself. In fact, Joint Publication 4-0 uses these four planning functions as the basis for its chapter "Planning Joint Logistics." It makes only an indirect reference to the steps of the joint operational planning process, and it does not

[6] Ibid., IV-15.

[7] U.S. Joint Chiefs of Staff, *Joint Logistics,* Joint Publication 4-0 (Washington DC: Joint Chiefs of Staff, July 18, 2008), I-2.

[8] Ibid., vii, x.

address how integration and collaboration are to occur, nor how the qualities and characteristics of the joint logistics planner are to be applied to achieve an effective concept for logistics support.[9] The only mention of JOPP as a process in Joint Publication 4-0 is found in the section on concept development: "This JOPES planning function relates to the following JOPP steps: COA Development, COA Analysis and Wargaming, COA Comparison, and COA Approval." It appears that there is an assumption that logistics planners are thoroughly aware of these steps and implies that logisticians have little to do in JOPP.[10]

Joint Publication 4-0 acknowledges the importance of integration, but fails to specify when, where, why, or how in the planning process that integration is to occur. Furthermore, Joint Publication 4-0 is weak in articulating conceptual understanding of the mission analysis planning phase of the joint operational planning process. While mission analysis planning activities involve "identifying assumptions, planning forces, mission and desired end state," the role logistical planners play is largely limited to providing logistical assumptions and highlighting "guidance contained in strategic logistical documents such as the Joint Strategic Capabilities Plan (JSCP) (Mobility and Logistic supplements) and related supplemental publications." Logisticians are also to provide "detailed information on airfields, seaports, road, rail, and bridging capabilities and other critical infrastructure." In actuality any planner can do this. The unanswered question is: how can the logistics planner use his knowledge and skills to support the entire mission analysis process better?[11]

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[9] Ibid., III-2.
[10] Ibid., III-5.
[11] Ibid., xviii, III-5.

Joint Publication 4-0 implies that planning is outside the logistics planner's scope of activity. "Effective planning," doctrine states, "enables logisticians to anticipate requirements, and validate, synchronize and integrate them with available resources to minimize duplication of effort, resolve shortfalls, mitigate risk and ensure effective support of CCDR requirements." This implies that only if planning is effective, can the logistics planner exercise his skills and capabilities. It also implies the logistics planner is a passive role player until called upon for an opinion.[12] Yet at the same time, doctrine is quite specific in stressing that joint logistic planning identifies "roles, responsibilities, key tasks and resources, along with the sequencing of logistical capabilities to meet the commander's intent." It also "identifies future requirements and proposes solutions, "in order to "fully integrate support planning and operations." "The more integrated the logistics plan is with the operational concept," doctrine asserts, "the more effective the overall operation will be."[13]

The Principles of Joint Logistics

As a guiding document for joint logistics planning integration of logistics with operational planning, Joint Publication 4-0 falls far short of providing any specific guidance or methodologies for accomplishing these goals. However, doctrine does provide the means for this integration, even if it is not explicitly mentioned. The means is through the principles of joint logistics. These principles provide the outline for logistics planners to interface with operational planners. Joint Publication 4-0 describes the principles of logistics as a guide for analytical thinking for joint logisticians during all of the planning steps. Doctrine

[12] Ibid., III-1.
[13] Ibid.

emphasizes that these principles "should be applied with creativity, insight and boldness." These principles are defined as they relate to joint planning as follows:[14]

Responsiveness is the reliability of support and speed of response to the joint force. The joint logistician provides this kind of support by matching logistic operations to the overall battle rhythm of the campaign so that the logistics planner can predict logistic issues and make adjustments to support operational needs.

Simplicity is lowering complexity through clear logistic processes and procedures in order to foster efficiency and execution, and to have more effective control over logistic operations. Simplicity is enhanced by clearly understood objectives to create unity of effort.

Flexibility is how logistic structures and procedures improvise and adapt to the chaos of the battlefield. This requires logistics planners to have a thorough understanding of the campaign plan so that they will be able to anticipate and predict developments and make sound decisions to support operational requirements.

Economy is meeting operational objectives and end states with the minimum resources necessary and within an acceptable level of risk. Logistics planners must understand the operational design and the concept of operations in order to establish the required support in terms of personnel, units and equipment necessary to meet the commander's concept of operations.

Attainability is ensuring that essential supplies and services required are available when needed to conduct operations at an acceptable level of risk. The logistics planner understands the importance of providing the required support during the transition between

[14] Ibid., III-3 to III-4.

phases, especially between Phase III (decisive combat) and Phase IV (transition). Planners balance inventories, capabilities, combat service support, and force reception throughput to meet the operational commander's requirements.

Sustainability is matching support requirements to operational requirements. Sustainability examines the operation from beginning to end to determine where to maximize the commander's ability to gain freedom of action through maneuver and uses the operational approach to place the enemy at a disadvantage and assure rapid defeat.

Survivability is understanding the critical roles bases, lines of supply, ports and airfields, and other critical logistics assets play in the conduct of operations. Protecting these locations and functions against potential threats ensures continuity of operations. The logistics infrastructure's survivability is enhanced through dispersion, flexibility designed operational logistic processes, and the allocation of forces for protection.

This chapter has analyzed the planning approach found in Joint Publication 4-0. While providing a broad overview of operational planning, it has very little to say about the joint operational planning process (JOPP) itself. It addresses capabilities and characteristics of logistics planners and presents the principles of logistics for planners to use, but has no guidance for how logistics planners are to apply these principles, nor methodology for logistics planners to use to integrate their activities with operational planners in the steps of JOPP. The following chapter will provide an overview of the joint operational planning process and provide recommendations for joint logistics planners to use the principles of logistics to integrate their planning actions with operational planners.

CHAPTER 2: LINKING JOINT LOGISTICS TO JOPP

"Logistical studies cannot tell us what weapons to procure or what tactics to use, but they can help us to ask some of the right questions"

Thomas M. Kane[1]

According to Joint Publication 5-0, JOPP is "an orderly, analytical process." Within this process are a number of steps that allow a staff and commander to make a logical examination of the mission to develop a mission statement. This mission statement becomes the basis for the development of courses of action (COAs). In the development of COAs the commander and staff apply operational art to assure that the capabilities of the force are applied to the greatest effect against the enemy. These COAs are then analyzed and compared to select the best COA. The selected COA is then developed into a concept of operations which form the basis for plan and order development. Operational design is fundamental to the process. It provides the conceptual framework from which the final plan will be developed. Once the mission is defined as a result of mission analysis, operational design promotes the development of COAs and allows for the development of a well developed CONOPS as well as the synchronization of forces and capabilities in time, space, and effect to accomplish the mission (See Figure 1).[2]

Joint Operation Planning Process
Step 1 Planning Initiation

Step 2 Mission Analysis

Step 3 Course of Action (COA) Development

Step 4 COA Analysis and Wargaming

Step 5 COA Comparison

[1] Thomas M. Kane, *Military Logistics and Strotegic Performance* (London: F. Cass, 2001), 149.

[2] U.S. Joint Chiefs of Staff, *Joint Operation Planning,* Joint Publication 5-0 (Washington DC: Joint Chiefs of Staff, August 11, 2011), IV-1.

Step 6 COA Approval

Step 7 Plan or Order Development

Figure 1: The Joint Operational Planning Process[3]

Within JOPP, step 2, mission analysis, is arguably the most critical, because it "is used to study the assigned tasks and to identify all other tasks necessary to accomplish the mission. Mission analysis is critical because it provides direction to the commander and the staff, enabling them to focus effectively on the problem at hand."[4] A review of the mission analysis activities shown in Figure 2 below, should show a direct integration of the principles of logistics from Joint Publication 4-0 with a description of supporting actions to illustrate how integration between the logistics planner and the operational planner should occur.

[3] Ibid., IV-2.
[4] Ibid., IV-4.

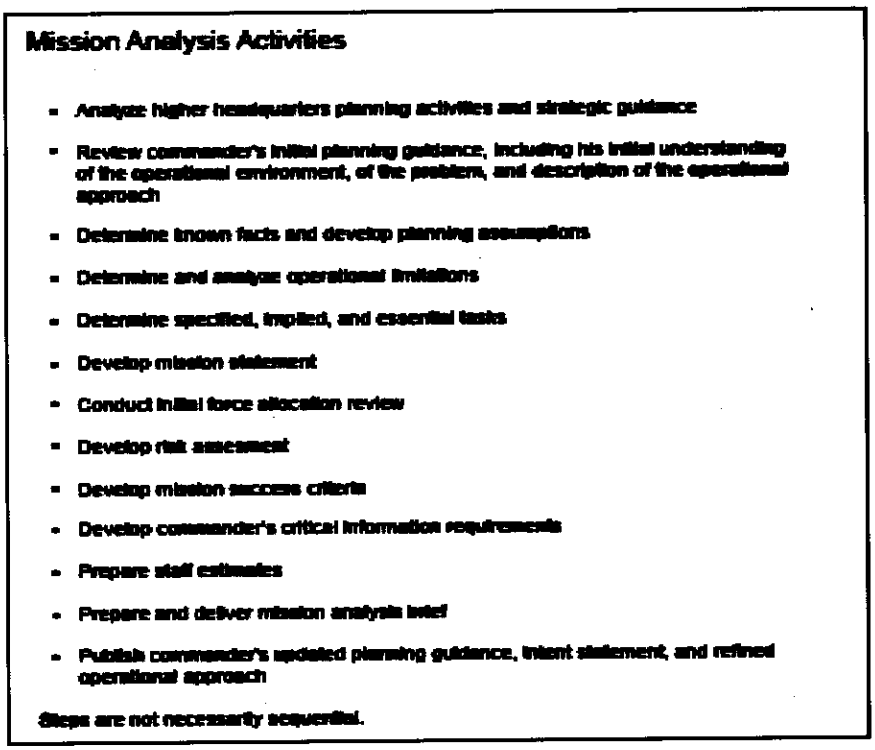

Figure 2: Mission Analysis[5]

Mission Analysis Integration

The mission analysis process covers thirteen distinct activities, eleven of which logistics planners should participate in to ensure that the perspective of the logistics planner is fully integrated into the planning process (albeit at varying degrees of involvement and detail – the logistics planner certainly provides support and expertise in the last two steps of mission analysis). Mission analysis activities should not be considered a step-by-step approach with a specific order. Instead, these activities should be viewed as a parallel, non-linear collaborative interaction between the operational and logistical planner. Joint Publication 5-0 outlines the mission analysis process, stating that "mission analysis typically involves substantial parallel processing of information by the commander and staff," but it

[5] Ibid., IV-6.

does not adequately highlight the significance of logistics-related considerations. What is needed is a guideline for this collaboration that allows both logistics and operational planners to anticipate requirements and foster early discussions.[6] The following approach takes each of the first eleven steps of the mission analysis process and presents a logistics planner's perspective that supports the efforts of the operational planner and enhances integration.

- Analyze higher headquarters guidance and strategic guidance

Logistic planners must understand each of the joint logistics principles as they relate to strategic guidance and direction from the joint operation staffs. By incorporating the application of the logistics principle of simplicity, the logistics planner seeks to create unity of effort. The logistics planner will be able to understand clearly the strategic and military end states, objectives, and conditions in either a national or multinational context. Logistics processes and procedures are initiated at this point to gain a complete understanding of how matching resources are nested in order to attain operational and strategic end states primarily through the logistics principles of economy and sustainability.

This matching of resources to end states was evident during the buildup of supplies and troops in Great Britain from 1942 to 1944. BOLERO was the logistics preparation for Operation OVERLORD, the plan for the Allied invasion of France. One main goal for BOLERO was the requirement to stage forty-eight U.S. divisions in Britain, used as a staging ground for troops and supplies for Operation OVERLORD, whose initial target date was May 1, 1944. England essentially became a pre-invasion storehouse of war material and personnel with almost all available land including parking lots, warehouses, and government property being used as staging grounds. Without modern advances in

[6] Ibid., IV-5.

technology, asset visibility was extremely problematic. Between January and June 1944, 1.5 million troops were staged in England and 750,000 tons of supplies a month were coming in and could not be warehoused. These supplies were stored in the open under camouflage netting.

This buildup was taking longer than expected and threatened the timetable for the operation to begin. Notwithstanding the operational issues of command and control authorities, insufficient amphibious training, and a yet to be appointed Supreme Commander, the heart of the delay was the insufficient number of landing craft. Compounding this problem was the sheer mass of support and supplies needed to conduct OVERLORD. Operational planners estimated that 12,000 tons of supplies per day were required for the 33 divisions that would occupy the beachhead in the weeks following the landing. Early in the planning process it was inevitable to acknowledge that logistics almost immediately dictated the scope and scale of the operational plan. It is important to note that OVERLORD's focus was securing a logistics base in Normandy. As Albert Norman has pointed out:

> After approximately two years of research and study, involving the problem of the strategically most desirable invasion route, that area [Normandy] was selected for its good beaches, its distance from known German Army reserves and fighter aircraft fields, its good terrain for airfield construction, and its proximity to the port of Cherbourg, a desirable first Allied objective.[7]

Planning focused on the ability to secure a beachhead and land a large number of forces. The D-Day problem was the enormous amount of logistics required to support the operational plan, but the limited infrastructure available to support the operational plan. Operational planning called for 185,000 men and 20,000 vehicles to be carried by 4,200 landing craft and supported by 1,200 cargo ships and auxiliary vessels, seven battle ships, 23 cruisers, as well

[7] Albert Norman, *Operation Overlord* (Westport, CT: Greenwood Press, 1970), 32.

as 20,000 paratroopers and 1,087 aircraft to transport them. In addition, 10,000 fighters and bombers would support the landings.[8] Assault divisions were required to keep the maximum number of vehicles to 2,500 instead of 3,000 that the operational planners insisted was the minimum number required. Operational planning called for the use of Cherbourg immediately following its capture to provide the logistics throughput necessary to sustain the buildup of divisions following the invasion.

For such a large-scale operation, "more than 6,900 vessels, including six battleships, 22 cruisers, hundreds of destroyers, landing craft and support ships" were needed to transport material and personnel.[9] Other necessary supplies included the additional logistical requirements created to support the use of "more than 10,000 aircraft-fighters, bombers and transports."[10] Once these supplies and troops arrived in England, new logistical challenges arose including lodging and feeding of soldiers, where to store supplies, and how to handle a large number of seagoing vessels for an extended period of time. Once logistical plans were created to address the large-scale pre-invasion concerns, the operational planning for the invasion of the coast of France came to light. This framework will be the foundation that the logistician begins to prepare logistics staff estimates.

- Review commander's initial planning guidance, including his initial understanding of the operational environment, of the problem, and description of the operational approach.

The logistical planner should be an active participant in analyzing the operational environment and the operational approach to gain an appreciation for the commander's

[8] R.W. Thompson, *D-Day: Spearhead of Invasion* (NY: Ballantine Books, 1968), 16-19.
[9] Ibid.
[10] Ibid.

understanding and visualization of the problem. This analysis of the operational environment provides a basis for identifying the tasks that may describe the mission and its parameters. The staff should not necessarily take the commander's perspective as the final answer, but should appreciate and further examine his understanding and visualization, so that the intent and planning guidance provided during the latter stages of mission analysis provides a strong basis for development of appropriate courses of action.

With the integration of the logistics principles of sustainability and survivability the logistician will contribute to an understanding of the environment by contributing essential information on critical logistics assets and an initial assessment of capabilities and vulnerabilities, while highlighting for the operational planner support requirements that may contribute to understanding the problem. Logistical planners and representatives from supporting organizations should maintain an open dialogue with the commander to assist in developing an appropriate solution to the problem, and be able to provide logistically sustainable solutions to match the evolving operational concept and identify as early as possible any potential shortfalls in support or sustainability.

In August 2003, OPLAN 1003V matured from a concept to an operational plan to remove the Saddam Hussein regime from power. General Tommy Franks ensured his team was engaging with Middle East nations to "permit staging, basing, and overflight – for naval forces, strike and reconnaissance aircraft, refueling tankers, and SOF – at a number of strategic sites close to Iraq."[11] Franks' invasion plan called for a fast rapid maneuver to throw the Iraqi military off balance whereas others, such as Colin Powell, believed mass to

[11] Tommy Franks, *American Soldier* (New York: Harper/Collins Publishers Inc., 2004), 387.

be the preferred approach.[12] The rapid approach would take fewer forces; the mass approach would take far more troops.

In dealing with the concern over the size of the force and the concern regarding troop deployment and redeployment, Secretary of Defense Donald Rumsfeld took a different approach. According to Rumsfeld, modern war required a change in strategy. Rumsfeld believed that the sequence of alerting, mobilizing, and readying troops was "a cold war relic."[13] According to Michael M. O'Brien in his book, *America's Failures in Iraq: Intervention to Withdrawal 1991-2001*, Rumsfeld first wanted to invade with less than 35,000 troops, which was soon discarded for a higher number, but not nearly enough.[14] Even with the final force number exceeding 35,000, "the administration, . . .went in with too few troops, but would not adapt to the changing situation in the field."[15]

From the beginning, skeptics criticized Donald Rumsfeld's handling of the Iraq invasion. They did not agree with the Secretary of Defense's opinion that speed would be an acceptable substitute for mass during the early stages of the campaign, and others believed there was a lack of appropriate planning to execute the operation especially the post-hostilities period.[16] As a result, Logistical planners and operational planners did not reach an agreement as to the number of troops needed to accomplish the mission until late in the planning phase.

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[12] Ibid., 396.

[13] Wesley K Clark, *Winning Modern Wars: Iraq, Terrarism, and the American Empire* (New York: PublicAffairs, 2003), 17.

[14] Michael M. O'Brien, *America's Failure in Iraq: Interventian to Withdrawal 1991*-2010 (Bloomington, IN: AuthorHouse, 2010), 57.

[15] Ibid., 79.

[16] Thomas E. Ricks, *Fiasco* (New York: The Penguin Press, 2006), 75.

The Army Chief of Staff, General Eric Shinseki, challenged the original operational plan by telling Donald Rumsfeld that "the war could be fought, and won, with half a million men." [17] Donald Rumsfeld's response to the concern that not enough troops were initially being deployed was "it's important to recognize that numbers do not necessarily equate with capability" and with that response Rumsfeld marginalized this skeptic. [18] The idea that numbers do not necessarily equate with capability is refuted by General Wesley K. Clark, in his book, *Winning Modern Wars: Iraq, Terrorism, and the American Empire:*

> Though the decisive phase of the operation was successful, there were also problems. First, the plan took what could be viewed as *unnecessary* risk because it skimped on the forces made available to commanders. And while the level of forces proved adequate for defeating the Iraqi military, the whole idea in military operations is effectiveness, not efficiency.[19]

The war began on March 19, 2003, and according to David Phillips in his book, *Losing Iraq: Inside the Postwar Reconstruction Fiasco*, "by March 30th, Donald Rumsfeld [was] criticized for not deploying enough ground troops."[20] The original planning led to a limited number of deployed troops in order avoid undesirable effects such as being "too expensive, too vulnerable, and too politically damaging at home."[21]

Franks requested the force size in the Gulf to total 128,000 soldiers, sailors, airmen and Marines by February 15, 2003.[22] The total force was planned to be 210,000 no later than

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[17] O'Brien, 72.

[18] David L. Phillips, *Losing Iraq: Inside the Postwar Reconstruction Fiasco* (New York: Westiew Press, 2005), 191.

[19] Clark, 85-86.

[20] Phillips, 242.

[21] Clark, 17.

[22] Franks, 409.

March 20, 2003.[23] Although the requested personnel were available, the lack of logistics integration with operational concepts was beginning to have adverse consequences. Colin Powell expressed his concerns regarding long sustainment lines. The lack of collaboration necessary with logistics and operational planners concerning the concept of speed and maneuver resulted in ignored concerns over long logistics lines needed to sustain the force. Planning was seemingly being conducted in a vacuum between the Secretary's office and General Tommy Franks, and a real disconnect between planners was occurring.

The idea of collaboration is that operational planning and logistics planning are not conducted in a vacuum, but rather the thoughts, ideas, and considerations of the operational and logistics planners are articulated early and often so that all ideas and rationale are well vetted to provide a fluid and logistically executable plan. Furthermore, the logistics planner would have clear view of necessities in the field while the operations planner would be able to see the availability of elements needed with regards to the needs in the field on a real time scale using new technology that utilizes satellite tracking of material. This integration would give the operational planner information regarding the availability of supplies, as well as manpower, to ensure the planned pace of operations are achievable and sustainable. Closing this gap will result in mutual visualization, appropriate phasing, timely decision making, and ultimately succinct joint integration between the operational and logistics planning teams.

Mutual visualization is best described as an outcome of design that allows for an appreciation for forces and functions within a context of realistic support. An example of this visualization for realistic support is the capability and throughput available at Air Ports of Debarkation (APOD) and Sea Ports of Debarkation (SPOD). Each APOD has fixed

[23] Ibid., 410.

capability which is usually a result of existing infrastructure limitations, such as runway restrictions that prohibit larger support aircraft from landing, which limits the amount and order of operational necessities. Similarly, each SPOD has fixed limitations such as insufficient water depth or pier capacity limitations that can be contentious for larger draft ships or ships requiring certain pier characteristics at SPODs not known by operational planners.

Appropriate phasing is necessary in order to accomplish realistic timelines to provide appropriate priorities of supply to meet maneuver force missions. While General Franks was clear on phasing, his 45-90-90 phasing approach lacked logistics integration and counted on full availability to utilize Turkey, which did not materialize.[24] Appropriate phasing is the art necessary to ensure material flow through APODs and SPODs are able to meet the maneuver force requirements.

- Determine known facts and develop planning assumptions

Logistic planners must develop logistics-related facts and logistics-related assumptions and provide them to the operational planner for concurrence and inclusion into the larger list being developed. This avoids the dangerous error of assuming that "unrealistic friendly capabilities would be available."[25] Logistics planners must make operational planners aware of a logistics assumption that will need to be verified as quickly as possible, since it has such a significant effect on the execution of the plan. Commanders and staffs should anticipate changes to the plan that may become necessary should an assumption prove to be incorrect.

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[24] Ibid., 389.

[25] Joint Publication 5-0, IV-8.

One logistical obstacle forecasted during the planning phase of OVERLORD included how to transfer a large number of troops and equipment from ship to shore without the use of deep water ports. Logistics planning intended to overcome this obstacle through the long term use of an existing port, Cherbourg and the short term use of two prefabricated harbors or artificial ports.[26] The two prefabricated harbors were to be constructed as soon as the beachheads were secured utilizing the labor of 45,000 men.[27] These harbors were called the "Mulberries" as they were named after the quick growing plant.[28] 15,000 men and a naval staff of 500 officers developed the Mulberry project utilizing more than 3,000 small craft to put the Mulberries in place.[29] In this example, the availability of the port of Cherbourg was a logistical-related assumption that was never verified as a fact. When it failed to be of immediate use, it had an effect on the entire tempo of the operation and caused major constraints on operations between July and August.[30]

Figure 3 illustrates the number of ships deployed to support the war and the actual amount of ships that were unloaded between June and September of 1944 and how this visual depiction could be used to inform the operational planner of the logistics constraints at the sea ports at the onset of U.S. involvement in World War II. The graph also shows the continued increase in the number of ships backlogged waiting to be unloaded in Europe beginning January of 1944.

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[26] Norman, 48.

[27] Max Hastings, *Overlord: D-Day and The Battle For Normandy* (New York: Simon & Schuster Inc, 1984), 197.

[28] Norman, 48.

[29] Thompson, D-Day, 12-13.

[30] Norman, 44.

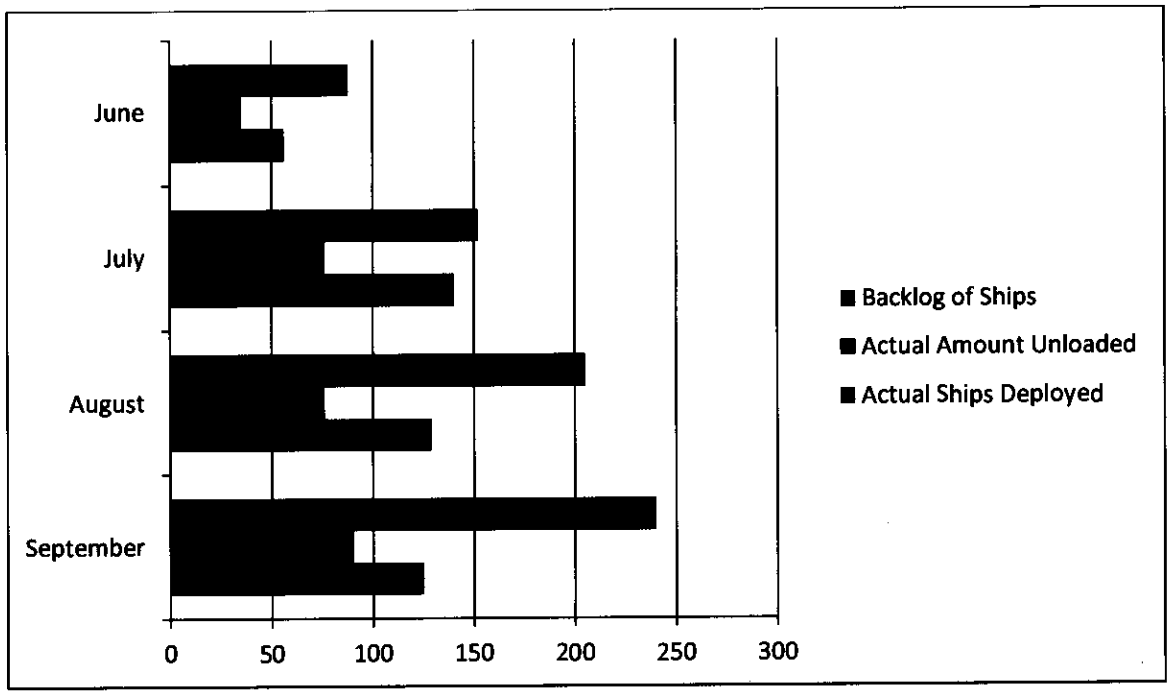

Figure 3: Growing Backlog[31]

By the end of June, the American supply build-up . . . was about 30 percent behind schedule.[32] From the beginning of the Normandy invasion, supply fell behind the operational requirements. The shipping backlog could not be made up simply because a port was not available. The majority of the transatlantic cargo ships were acting as floating warehouses until they could be unloaded. This meant that the transatlantic cargo ships were unable to provide the needed transportation for altemate supplies to be shipped from port to port.

Another example occurred during Operation IRAQI FREEDOM in 2003. A logistics-based assumption involved support and sustainment would flow through Turkey.[33] When this assumption was invalidated after the operation began by Turkey's unwillingness to allow American forces to use its ports. However, the principle of flexibility during the planning

[31] Ibid., 385
[32] Ibid.
[33] Franks, 404.

phase may limit its use in the subsequent conduct of operations. Logistics planners can use the principle of flexibility in mission analysis by gaining an understanding of the campaign plan in order to anticipate and predict developments, ensuring logistics-related assumptions are validated quickly, and to support sound decision making.

- Determine and analyze operational limitations

Operational limitations are actions required or prohibited by higher authority and other restrictions that limit the commander's freedom of action, such as diplomatic agreements, political and economic conditions in affected countries, and host-nation issues. Simplicity and economy are two of the most important logistics principles to be applied when determining and analyzing operational limitations. Operational limitations may cause the staff to modify what courses of action are developed or what COA is selected. Commanders must examine the operational limitations imposed on them and understand their influence on planning to maintain freedom of action during execution.

Because the entire operation was essentially based on logistics capabilities, operational planners believed that the capture of Cherbourg was an extremely important objective. Planners for OVERLORD believed that the capture of Cherbourg was essential because of its logistical capacity and throughput. Both were needed to build up and sustain forces in the beachhead. Without the capture of an intact Cherbourg port, it would not be possible to land as many divisions as operational planners wanted resulting in the increased use of airborne forces. Divisions would be physically limited in the number of vehicles they could initially land. Moreover, 12,000 tons of sustainment per day would have to be conducted on the beachhead by the Mulberry artificial harbors.

The original logistic plans did not anticipate a need for more than the two artificial ports, nor did the operational plan anticipate problems with Cherbourg. Cherbourg was not immediately available for use as a deep sea port after its surrender on 27 June due to the large-scale destruction of the port by the Germans. Cherbourg was not able to handle an appreciable amount of transport ships until August, which was far too late to influence the operation. As one historian noted, "for almost four months after the launching of OVERLORD its logistical support had to be brought in using . . . a few small ports on the north coast of Brittany that had not even figured in the original plans."[34]

Operational planners did not appreciate complexities until logistic planners showed the difficulties and forced a revision of the plan. Operational planning for expanding the beachhead could not be accomplished as planned because of unanticipated logistics shortfalls. Follow-on missions of ground forces had to be postponed because of backlogs for the transportation of replacement and backup troops from England to France. It soon became apparent that a different mode of transportation would be needed to accommodate the large amount of troops and supplies necessary for continued operations. Troops and cargo that were waiting in the Atlantic would have to be stored until landing craft could get to each ship to unload them. These shortfalls should have been evident at the outset of planning.

- Determine specified, implied, and essential tasks

The commander and staff typically will review the planning directive's specified tasks and discuss implied tasks even as clearly as planning initiation to resolve unclear or incorrectly assigned tasks with higher headquarters. If there is no immediate disconnect, the

[34] Richard M. Leighton and Robert W. Coakley. *The War Department: Global Logistics and Strategy 1943-1945.* Washington: U.S. Department of the Army, Office of Military History, United States Army in World War II, 1968. 370-372.

JFC and staff will confirm the tasks before developing the initial mission statement. As the list of tasks by category is being developed, the logistics planner must integrate with operational planners to examine and assess the tasks in order to employ the logistics principle of economy. The tasks have to be assessed from the logistician's perspective so that support resources are balanced with operational objectives and end states. The logistician must also be involved in categorizing tasks. What is essential to an operational planner must also be validated by the logistical planner. Many implied tasks tend to be related to logistics support and sustainment. Logistics considerations, therefore, must be considered before determining an essential task.

An essential task in the OVERLORD mission statement was to gain a lodgment on the continent of Europe. There were significant operational as well as logistical concerns that had to be identified and reconciled before validating it as an essential task. The need for supplies at the operational level and the logistical challenges of meeting those needs is a reflection of disconnect between the operational planner and the logistics planner. The following examples describe how a lack of understanding by the operational planner regarding logistics planning became a hindrance to the accomplishment of operational objectives and leaving soldiers on the battlefield without essential supplies.

One logistical challenge not recognized during the operational planning phase of the invasion of Iraq was the ability of helicopters to take off, fly, and ultimately land in areas surrounded by large amounts of dust. Operational planning relied heavily on the use of helicopters for the transportation and relocation of troops and their supplies. Pre-invasion operational planning called for the use of more than 150 Mobi-Mat helipads throughout Iraq

for use by the helicopters carrying out the operational initiatives.[35] Upon arrival in theater, it was determined that the helipads did not prevent the problem it was intended to solve: taking off and landing amid large amounts of dust. The reliability of helicopter usage was significantly less than the calculated original logistic planning. It was determined during early operations that helicopter reliability needed minimizing to ensure the safety of troops and the preservation of assets. The large amount of dust also resulted in components failing at a much higher rate than planned. The result is an increase in maintenance requirements as a result of component failure as well as a much higher demand for repair parts ultimately necessitating the requirement for more resupply capability. This conclusion brought about many other logistical challenges that included the need for additional land vehicles to substitute for the use of helicopters and the need to increase range and depth levels in order to meet the increased maintenance demands.[36] To the operational planner, this appeared to be a logical alternative to helicopters. However, a large number of ground vehicles used in place of helicopters magnified logistical complications. Only a limited number of vehicles were readily available due to manufacturing and shipment restraints. All excess vehicles not originally deployed into theater were saved for use as replacements for the originally deployed vehicles. If additional vehicles were sent as initial supplies, then replacements would not be available when needed. Even if more ground vehicles became readily available, fuel consumption created demands for fuel shortage and distribution that went far beyond original estimates. Thus, one operational planning assumption created numerous logistical challenges that could have been avoided early in the planning process.

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[35] Rick Atkinson, *In the Company of Soldiers- A Chronicle of Combat* (New York: Henry, Holt and Company, 2004), 199.

[36] Ibid., 203.

- Develop mission statement

The planning process up to this point in doctrine encourages the development of the mission statement prior to the consideration of logistic staff estimates, which is listed much later in the process. Although doctrine also states that these steps should not be considered sequential, there is an imperative to begin staff estimates, especially logistics staff estimates before the mission statement is prepared. The logistics planner needs to provide much of what is to be done in the logistics estimate earlier in order to influence the mission analysis process and the development of the proposed mission statement. This is important because the commander's operational approach informs the mission statement and sets the basis for planning guidance and the development of COAs. The logistics principle of responsiveness supports developing a mission statement. The logisticians ability to be responsive to operational needs enables the logistician to be able to predict logistic issues and make adjustments to support operational needs as required.

- Conduct initial force allocation review

A review of reserve and active component forces that are apportioned for planning is essential for logisticians. The logistics principle of survivability should be applied to ensure initial force allocation is sufficient for the continuity of operations.

At the heart of the Allied culmination in September 1944 was the disparity between the estimates of the logistics planners and the operational planners. Figure 4 shows the difference between the initial estimation of ships to be unloaded as proposed by the logistician during planning, versus the proposed estimation of ships that operational planners believed sufficient. The actual number of ships that were unloaded during July and August

of 1944 already indicates that the logistical estimates were more accurate, but the inability to offload even the operational planners more modest requirements had a significant effect of Allied efforts to breakout from Normandy.

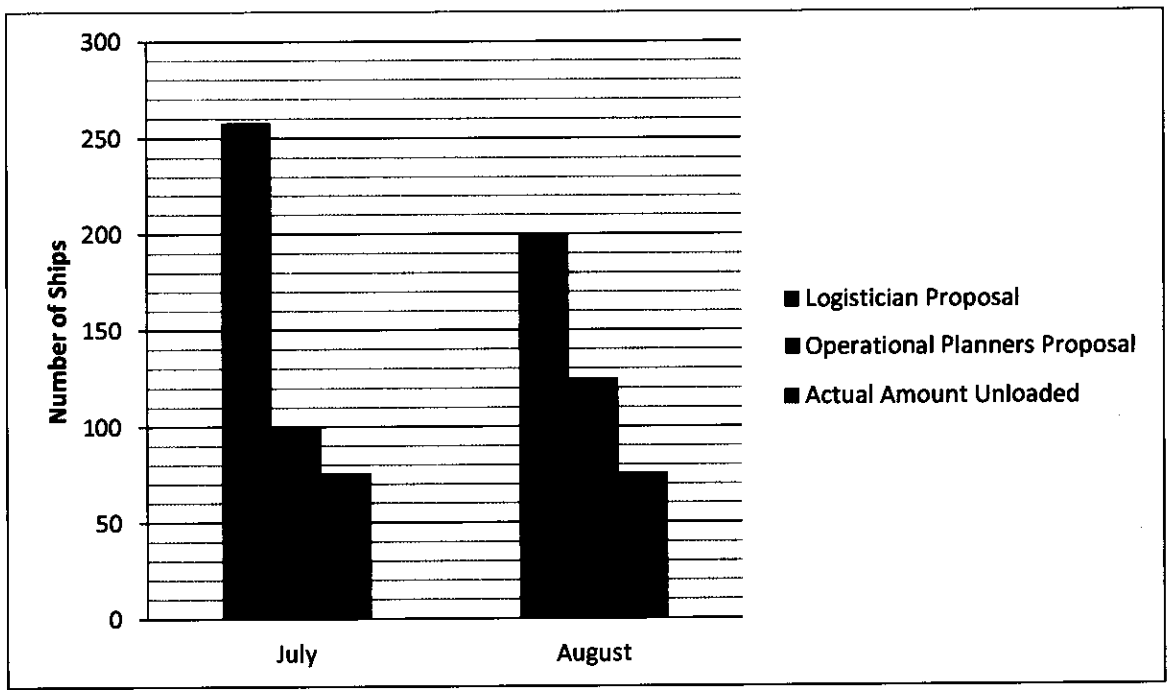

Figure 4: Unload Capacity[37]

The number of ships to be unloaded following D-Day did not change from July to August. This figure clearly indicates the significant consequences of a lack of coordination between the logistical planner and operational planner. The reality of what could be unloaded represents how significant logistics was to the entire operational plan, something the operational planners appreciated, but did not fully focus on. Logistical planners and operational planners must refer to specified and implied tasks and determine what broad force structure and capabilities are necessary to accomplish these tasks and identify shortfalls between the two.

[37] Ibid., 392.

- Develop risk assessment

Logistics planners and operational planners together must integrate and conduct a preliminary risk assessment. The logistics principle of attainability applies to ensure that essential supplies and services required are available when needed to conduct operations at an unacceptable level of risk. Operational planning did not always anticipate logistical complications that arose in theater. The major logistical obstacle was transportation of troops and supplies during World War II. The initial plan called for the use of England as a staging ground; troops and supplies were to be brought across the channel and unloaded at two artificial harbors or eventually, Cherbourg. The alternate mode of logistics flow by necessity became air transportation, but airfields were limited and required both security and large numbers of personnel. Moreover, once supplies were offloaded at the airfields there still remained the basic problem of a shortage of transportation assets.

Logistics determined the scope, scale, and tempo of the Normandy campaign. Unfortunately, the inability of the Allies to exploit German weaknesses and overwhelm German forces in France can be directly related to the breakdown of communication between logistical planners and operational planners at the initial planning effort. Although operational planners understood the importance of logistics, they did not accept the logistical planners' estimates or show an appreciation for the consequences of logistical limitations on operational objectives. This failure at the initial planning effort had significant consequences. Risk to a logistician may be far different than risk to an operational planner. Logistics planners must provide their input to highlight threats to success if certain logistics functions fail. Discussing risks in terms of logistics support highlights the significance of

logistics support and moves the staff to take action to mitigate threats and ensure flexibility, attainability, and survivability.

- Develop mission success criteria

Logistics planners must be able to incorporate the logistics principle of sustainability by matching support requirements to operational requirements. Mission success criteria must describe the standards for determining mission accomplishment and the logistician must understand how logistics support is responsive, simple, and flexible enough to support the operation. Logistics planners define the suitable support to the operational plan in order for the joint force to accomplish the mission as defined by the mission statement. In order for this sufficient logistical support to occur, the logistics planner must be cognizant of how the integrated logistics approach supports the operational plan utilizing logistics principles in order to reach the mission termination criteria.

For example, during Operation IRAQI FREEDOM, original operational planning estimates regarding Army fuel consumption was around 40 million gallons during the first three weeks of the invasion. Logistical planners were able to determine that a pipeline from Kuwait to Udairi would be the best method for transportation to the staging area. Once the fuel reached the staging area, it would be used to fill the vehicles and then loaded into tanker trucks for transport to troops at the front of the surge. Once in theater, it was determined that original estimations were significantly lower than the actual needs of the force. Operational planners needed more fuel, but logistical planners were unable to meet the need due to physical constraints. This is because there were not enough vehicles to supply the required amount of fuel.

Fuel constraints were heightened by the fact that consumption of fuel by helicopters is much different than that of wheeled vehicles. Although both types of transportation use JP-8 fuel, helicopters require the use of specialized testing equipment to ensure the purity of the fuel before it is used. JP-8 used by ground vehicles does not require the use of testing equipment to determine fuel purity. In order for the testing of the fuel to be completed in theater special 2,500 gallon fuel trucks with testing equipment were required. Although smaller and faster moving fuel trucks were on hand to refuel ground vehicles, there was not enough to meet the refueling demands of the force. These basic disconnects between logistics planners and operational planners directly influenced the conduct of the operation.

- Develop Commander's Critical Information Requirements

Joint Publication 4-0 emphasizes that "the logistician should be able to monitor, assess, and direct (when required) logistical operations in order to assure that the concept of support is being effectively executed."[38] In order to accomplish this, the logistics planner must actively participate in developing the commander's critical information requirements. A commander must know when his force is unable to be sustained. Any breach in the logistics chain that hampers the overall ability of the joint force to accomplish its mission must be considered and included in the Commander's Critical Information Requirements. Identifying critical information requirements related to logistics will assist the joint force commander in achieving situational awareness and visibility "over the status and location of resources, over the current and future requirements of the force, and over the joint and

[38] U.S. Joint Chiefs of Staff, *Joint Logistics,* Joint Publication 4-0 (Washington DC: Joint Chiefs of Staff, July 18, 2008), IV-1.

component processes that deliver support to the joint force."[39] Artillery commander Colonel William L. Greer explained how the logistical challenges affect the operational level of war. This story, as recalled in the book *In the Company of Soldiers: A Chronicle of Combat*, points out that soldiers entering the front lines of Iraq had supplies available to last about 5 days. After that, there was a need for resupply. The result of this resupply requirement was an uneven distribution of supplies because helicopters had been grounded due to dust storms and the trucks needed to transport supplies were still at sea.

During the initial invasion, for example, one Marine unit was down to one day's worth of food (Class I), yet the same unit had ample supply of fuel (Class III).[40] In yet another instance, the 3rd Infantry Division had not been resupplied with food and water or ammunition (Class V). During that same time, the Division was hauling excess fuel. There were needs at the operational level that were affected by the logistical complications surrounding the transportation of such supplies. This is largely a result of operational planners not anticipating logistical complications of transporting supplies if helicopters were grounded.

Once it was determined that more ground movement would be made than was originally anticipated, keeping ground vehicles up and running became an important and difficult task. During the first year of operations following the march to Baghdad, "on an average day, approximately 130 to 140 major logistical convoys were on the roads in Iraq, consisting of roughly 1,800 to 2,200 trucks and around 4,000 personnel."[41] Orders were

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[39] Ibid., IV-4.

[40] Atkinson, 260.

[41] Donald P. Wright and Timothy R. Reese, *On Paint II: Transition to the New Campaign- The United States Army in Operatian Iraqi Freedam May 2003-January 2005*, (Fort Leavenworth, KS: Combat Studies Institute Press, 2008), 506.

given to provide each Humvee with a spare tire once it was determined that ground movement would be the primary transportation. Logistical planners were required to make these spare tires available. Once the spare tires for the Humvees were issued, a new challenge became very apparent. Each Humvee was outfitted with a canvas roof that was unable to support the weight of the spare tire.[42] Since the canvas roofs could not be used to transport the tires the next challenge became where to put the tire on each Humvee. The final determination was that sheets of plywood would be needed to shore up the roofs of the Humvees. Once it was determined that plywood would be used the next challenge was procuring enough plywood.[43] This simple requirement created unplanned logistics support requirements that had a significant effect on the pace of operations.

Operational tempo, otherwise known as ops tempo, refers to periods of time where troops, equipment, and their supplies are employed, replenished, or redeployed. High ops tempo refers to periods of time when troops and their supplies are employed at rates exceeding traditional deployment ratios initiatives. The war in Iraq, especially Operation IRAQI FREEDOM, was a prime example of high ops tempo. General Tommy Franks sought to use high ops tempo to his advantage. However, the United States and Coalition partners were largely unable to adapt to the high ops tempo sustainment challenges. In the end, the speed of the ground advance forced supply lines to catch up in order to provide timely replenishment. The changing of the supply routes, revised missions, and changes of timing to cope with unpredictable sand storms were all symptoms of the operational requirements not being supported by the logistics capabilities applied by the logistics planners.

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[42] Ibid, 507.
[43] Ibid.

Spikes in ops tempo artificially resulted in a demand spike for repair parts and provisions. In 2003, commanders were urged to push forward as fast and as far as possible, provided their logistics would permit such advance. But without a clear understanding of logistic capabilities and without effective operator and logistic support integration, the important lesson of logistics dictating operational tempo again became clear.

The result was predictable. The high ops tempo led to equipment and required supplies being used at rates that exceeded the ability for timely and effective replenishment. An Army staff officer summarized the problem "We're really in dire straits with resourcing," he said, there's not enough armor for Humvees. There are not enough fifty-caliber machine guns for the 101st Airborne or the Tenth Mountain Divisions. A country that can't field heavy machine guns for its army—there's something wrong with the way we're doing business."[44] Further logistical versus operational issues came to light when it was determined the body armor issued to ground forces was insufficient. Humvees were inadequately prepared for operations in Iraq. One soldier said, "the armor wasn't what I had expected; it was simply steel sheets that had been cut with a torch and attached in theater."[45]

The high ops tempo also created problems for the Navy at sea. The logistics capability to replenish was challenged when ships accustomed to frequent replenishment were not receiving their normal resupply. Many smaller ships were looking for support of the bigger ships underway to assist with filling shortages otherwise underway sustainability would not be possible.

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[44] James Fallows, *Blind into Baghdad: America's War in Iraq* (New York: Vintage Books, 2006), 140-141.

[45] Phil Kiver, *182 Days in Iraq* (Tarentum, PA: Word Association Publishers, 2006), 29.

Operational level planning estimates and logistics requirements show a consistent parallel from the onset of Operation OVERLORD in World War II through Operation Iraqi Freedom, which amounts to a nearly a 60-year span of time. In OVERLORD and Operation Iraqi Freedom there was a large force requirement, but a relatively minimal means of sustaining the force. In both historical examples, the United States was to deploy combat power utilizing logisticians to analyze limits, fill gaps, and maximize efficiency to move as many troops as possible without delay. This initial scale accounted for the movement of troops to accelerate once port capacity was large enough to accept the numbers of troops and equipment for the acceleration. Troop deployment would then continue on a predicted schedule that would include troop reallocation from their home bases inside and outside of the United States. This problem existed in 1944 and 2003. Figure 5 below depicts the plan to reallocate units at bases outside the United States as backup and replacement units for the troops already in theater to address backlogs in 1944. Operational planners envisioned deploying more than 20 divisions by D+30l and the number of divisions would increase by 10 divisions every 90 days. This plan became unsustainable from the very beginning of the Normandy invasion. As the official history indicates, "The deployment of U.S. ground combat power...had been accelerated, but logistical limitations prevented its full employment when it was most needed."[46]

[46] Ibid., 383.

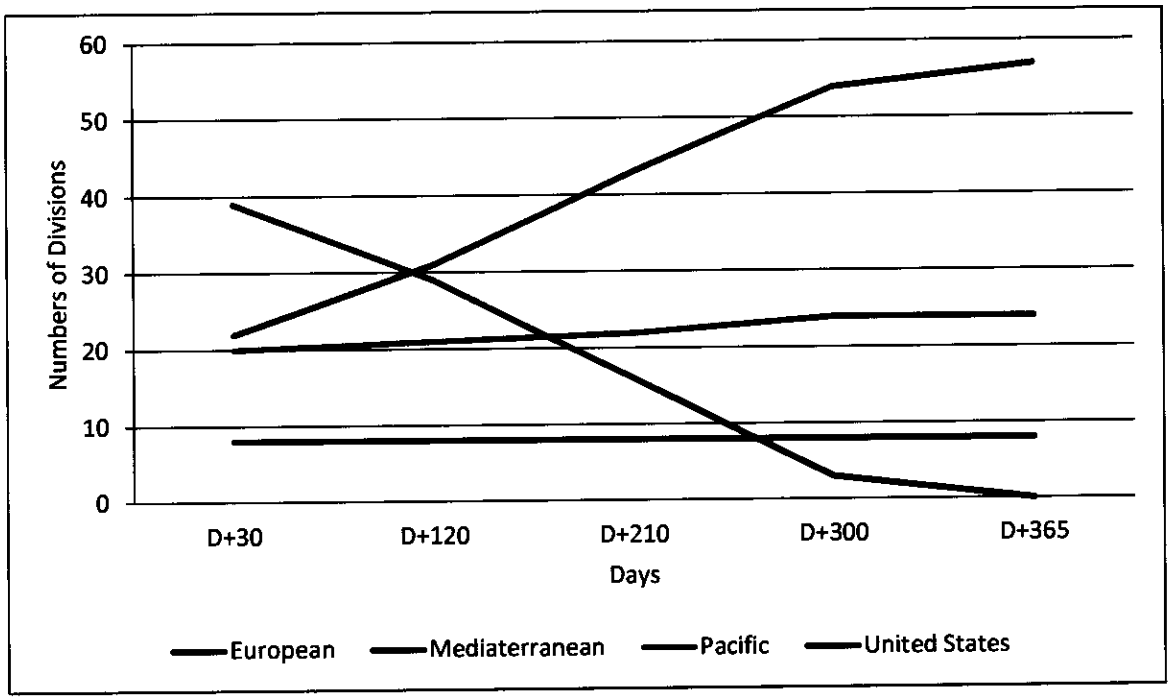

Figure 5: Troop Movement[47]

Additional parallels between the two campaigns raise questions regarding growth within the joint community, and more specifically, collaborative effort of the joint logistics planner and the joint operational planner. Logistics estimates are based on the successful achievement of key decisive points, unanticipated rapid advance, extraordinary supply requirements that affect the tempo of operations, and estimates of the enemy's capability to regroup and defend.

Problems existed in both campaigns when the scope of operations was not fully logistically supportable or the logistic requirements are not fully integrated into the plan. Operational planners seeking to accomplish missions without fully appreciating the logistics limitations resulted in significant challenges that changed the nature of the operations. This inability of planners and logisticians to collaborate continues to be a problem. The solution

[47] Ibid., 347.

is a doctrinal approach to planning collaboration. The common failing point for both studies is found in mission planning.

- Prepare staff estimates

It cannot be emphasized enough how important staff estimates are to the planning process both in terms of operational planning and logistics planning. The logistics overview developed in this step touches upon earlier steps in the mission analysis process. For example, the logistics overview is to include critical logistics assumptions and information requirements that should be included as part of the Commander's Critical Information Requirements. It also is to include assessment, inventories, conditions in theater that affect logistics, host nation support, and any shortfalls. In effect, all of the mission analysis steps are combined in the estimate. A logistics estimate is to be prepared from this information "that identifies and addresses known and anticipated factors that may influence the feasibility of providing required logistics support."[48] As illustrated above, the collaboration and integration of logistics and operational planners is far too important in the preceding ten steps to develop such an overview and estimate toward the end of the mission analysis process. Too much valuable information is potentially not being shared that can have a significant influence on the mission statement and the subsequent development of the operational design and the COAs.

The Logistical Planner and COA Development

Joint Publication 5-0 highlights a step-by-step approach to course of action development. Using this approach, it is possible to overlay a logistics support methodology

[48] Joint Publication 5-0, IV-14.

to provide the details necessary to ensure the COAs are feasible. As Joint Publication 5-0 points out, a feasible COA accomplishes the mission within the resource limitations; it assesses if the force structure and lift assets are sufficient to execute the COA "with the forces, support, and technology available within the constraints of the physical environment and against expected enemy opposition."[49] Therefore, the logistics planner plays a significant role in ensuring interaction with operational planners takes place in COA development. The COA development steps are outlined as follows:[50]

1. Determine how much force will be needed in the theater at the end of the campaign, what those forces will be doing, and how those forces will be postured geographically. Use troop-to-task analysis. Draw a sketch to help visualize the forces and their locations.

The logistics planner must be involved in this step so that constraints or restraints can be identified here. Additionally, the logistics planner must be involved in this step because basing requirements and transportation to those bases are fundamental to logisticians. Looking at the sketch and working backwards, determine the best way to get the forces postured in Step 1 from their ultimate positions at the end of the campaign to a home base or garrison. This will help formulate the desired basing plan.

Planners must explore what basing is required such as size, security, transportation, storage, maintenance, air, road, and rail access. Security is also required to safely ensure delivery of Class I, III, V, VII, and IX materiel throughout all phases of the operation, which helps to determine the necessary size of the logistics footprint.

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[49] Ibid, IV-24.
[50] Ibid, IV-20, Fig IV-8.

2. Using the mission statement and concept of operations as a guide, determine the tasks the force must accomplish en route to their locations/positions at the end of the campaign. Determine key logistics events and actions that must take place to support attainment of decision points and transition from phase to phase.

This step is heavily operational, but integration is key, because it provides the logistician guidance and enables the logistician to ensure the forces do not reach culmination.

3. Determine if the planned force is enough to accomplish all the tasks in the mission statement. Adjust the force strength to fit the tasks. Balance force strength with logistics capacity.

The logistics planner must be integrated to ensure that any adjustments made in the plan are logistically supportable, and if not, the logistician must provide recommendations and address the constraints or restraints identified in planning.

4. Given the tasks to be performed, determine in what order the forces should be deployed into theater. Consider the force categories such as combat, protection, sustainment, theater enablers, and theater opening.

Logistics planners must be involved in this step so that recommendations regarding capacity can be discussed. There is a finite lift constraint regardless of the mode of transportation that must be addressed and logistics planners must be involved to ensure the right lift capability is available and addressing concerns where appropriate. The information developed should now answer questions regarding force employment, major tasks and their sequencing, sustainment, and command relationships. Logistics requirements help drive all of these considerations.

Logistics Design and COA Development

A logistics design is necessary to support all five steps of COA development design as each phase requires distinct logistics support. A comprehensive understanding of operational design by the logistician enables logistics support to overlay the COA development. Logisticians who understand the phasing construct are able to lay out a companion design for logistics support that includes force size, logistics support estimates per phase, logistics considerations per decisive point, force flow and the force support requirements for each phase and at the end of the operation. Each step of logistics design mirrors the five steps of COA development.

1. Logistics planners identify the end state and objectives. From the end state, derive force support estimates, logistics throughput, priority of support, and lift requirements that define the end state conditions.

The key principles that apply to this step are economy and survivability. Economy is vitally important because it nests with the logistical support necessary to meet operational objectives and end states. In this step, the logistics principle of sustainability is equally as important as economy because sustainability requirements inherently prioritize logistics throughput, support, and lift requirements in order for operations to reach the determined end state. In military operations, sustainability requirements can be uniquely different for each of the phases of operations such as deterring the adversary in Phase 1 and enabling civil authority in Phase 5. In other operations such as Humanitarian Assistance/Disaster Relief the logistics principles of economy and sustainability are still equally viable.

2. Logistics planners begin detailed basing requirements for the force for each phase, providing timeline for establishment and operation, manning, security and support

requirements such as identifying logistics operations centers and basing support depots as necessary.

The key principle of logistics that applies to this step is survivability. The understanding of the required logistics infrastructure enables planners to estimate the logistics flow and support requirements as operations progress through each phase. When ground troops advanced toward Baghdad, in Operation IRAQI FREEDOM, the survivability principle of logistics was tested as security and support requirements increased in order for support convoys to attempt to keep pace with operational movement and maneuver progress. Planning in advance for these events would have avoided some logistical support delays.

3. Logisticians understand the tasks required for the force to achieve the named decisive points. Analyze the operational requirements and translate them into logistics support requirements. Establish priorities of support by phase to support achievement of decisive points.

The principles of logistics that are of importance to this step are simplicity and responsiveness. Simplicity allows logisticians to provide support in order to achieve planned decisive points especially when achieving key decisive points can require varying degrees of logistical support along each line of effort. Thus, maintaining adaptable support that is intrinsically simplistic should be sought as it allows operational level support to be understood throughout all levels of leadership. The logistics principle of simplicity implies that logistical support should not be categorically modified despite the varying degrees of support. These principles allow an appropriate understanding of where logistical support is to be provided from and precisely how it is to be provided. Responsiveness is indicative of logisticians to provide timely support for each decisive point to be reached. Logisticians will

respond and match logistic capability to the planned actions of the military force, so that necessary adjustments, if required, are made to support operational needs.

4. Analyze force flow to validate the operational plan. Identify critical shortfalls or risks. Identify planning contingencies, branches and sequels. Analyze these for supportability and sustainability. Calculate logistics throughput for forces for each phase of the operation.

The principles of logistics that apply to this step are attainability and sustainability. Understanding what the required essential supplies are, and being able to attain those required supplies, is essential in order to validate and provide support so that operations can be conducted at an acceptable amount of risk during the transition of phases of the operational plan. The logistics principle of attainability complements the logistics principle of sustainability during this step as sustainability will validate the operational plan to ensure friendly forces remain capable to place the enemy at a disadvantage and assure rapid defeat.

5. Establish logistics support criteria in terms of manpower, equipment, and other resources necessary to support the operation. Define priority of movement and operational support requirements.

The key principle of logistics that applies to this step is flexibility. The understanding of a flexible logistics structure by operational and logistics planners to enable commanders to adjust when fog, friction, and chance dictates flexible logistics support to meet adapting movement and operational support requirements. This requires thorough understanding of the campaign plan by logisticians so that they will be able to anticipate and predict developments in order to make sound decisions to support operational requirements.

CHAPTER 3: ESSENTIAL JOINT LOGISTICS COMPONENTS

"Logistics...in the broadest sense, the three big M's of warfare – material, movement and maintenance."

James A. Huston[1]

Timely decision making is critical to the effective, efficient, and realistic responses to branches, sequels, and commander's decision points. Common understanding of the operational requirements and logistics supportability enables the decision making process to be conducted with common understanding of what, when, where, why, and how the operational plan can be supported logistically by either push or pull resupply with the assistance of organizations such as the Defense Logistics Agency and U.S. Transportation Command (USTRANCOM). Joint integration is the understanding of how services provide support and how they adapt these characteristics to the strength of a joint force that must overcome unnecessary challenges because of logistics gaps.

In order for joint logistics planning integration to work, a standard of resupply needs to be created that would accommodate the ever changing theater environment while taking logistical complications and the necessity to remain flexible into consideration. (The method that would best meet these requirements would be one that forms a resupply balance that includes a push and pull method of resupply). The term push is used to describe a method where items are automatically shipped without ordering needing to be done by the end user or in this case, the troops in theater. The term pull is used to describe items that would need to be ordered by the end user and would not be shipped on any type of recurring schedule.

[1] Matthew D. Cox, "Logistics: Logistics Quotations," The WWW Virtual Library, http://www.logisticsworld.com/logistics/quotations.html (accessed October 5, 2011), 3.

Part of creating standards for resupply would include creating an automatic resupply system across the joint force known as the process of pushing the required materiel to the end unit. An ideal example of a commodity easily able to be pushed would be Class I, subsistence. Class I materiel would easily be able to be pushed because personnel managers know exactly how many soldiers, airmen, sailors, and marines are in each unit in need of three meals per day. From that point it becomes a simple math problem of personnel times three meals per day (plus ten percent to allow for growth, waste, spoilage) to know exactly how many servings are required during the replenishment period.

All other classes of supply that have predictable replenishment requirements resulting from predictable usage can also qualify as likely candidates of push resupply. The basis for resupply can occur with automated inventory functions. Creating tables for replenishment reorder points can enable units to maintain adequate stock on hand for line items with authorized inventory allowances. Proper integration would allow for logisticians to adjust allowances up or down based on anticipated or known spikes in demand and would allow the resupply push system to identify these changes through regularly scheduled automated updates and would react accordingly providing the required necessary flexible logistics support.

Pull supply replenishment would be the prominent tool for resupply of low demand items where the end user would need to order items as needed. Items that would be included in the pull method would be items that do not have an authorized allowance level, but the material is required to remove equipment from degraded status. Pull resupply allows logisticians to view all automated systems for on hand inventory levels. If the item is on

hand, the requisition document is processed and the materiel is prepared for deployment based on the best method of shipment as determined by the location of the requesting unit.

Logisticians should be well versed in not only the strengths and capabilities of these organizations that are vital to integration, but to the limitations of these organizations as well. Having a clear understanding on how the procurement and expediting processes work can save the operator days, weeks, and sometimes even months of delays. Numerous factors impact the availability of much needed parts in theater and include examples such as high price low demand requirements, obsolete repair parts not cost beneficial for companies to consistently manufacture, and stringent military specifications.

The use of non-military agencies is essential to the success of the integration of joint operational planning and joint logistics planning. Agencies such as the Defense Logistics Agency and the U.S. Transportation Command are vital to the success of full integration and will be the means in which the integration between the operational and logistics planners will execute their integrated planning efforts.

The Defense Logistics Agency

There is no civilian company that supports the military in the same manner as the Defense Logistics Agency; thus comparisons are not possible. In order to adequately compare the Defense Logistics Agency's contribution to military readiness in comparison with the civilian market it would best be prudent to look at the Defense Logistics Agency's sales figures for FY10. In FY10, the Defense Logistics Agency supported $28 billion in

sales and $41 billion in services.[2] This throughput would rank the Defense Logistics Agency in the top 10 percent of all Fortune 500 businesses.

The Defense Logistics Agency website defines its mission as providing the Army, Navy, Air Force, Marine Corps, other federal agencies, and combined and allied forces with the full spectrum of logistics, acquisition and technical services.[3] Joint Publication 4-0, *Joint Logistics,* states that the "Defense Logistics Agency manages, integrates and synchronizes suppliers and supply chains." [4] The synchronization of supplies by the Defense Logistics Agency includes providing equipment, supplies and services in support of major aviation, ground and maritime systems through "tailored logistic support, optimized investment strategies and capitalized commercial business practices."[5]

The Defense Logistics Agency operates in 48 states and 28 countries including managing 26 distribution depots worldwide while employing nearly 27,000 civilian and military employees. The Defense Logistics Agency manages eight supply chains and over five million items in support of over 1,900 weapons systems. Major Defense Logistics Agency strengths from a logistician perspective include real time web-based asset visibility and their worldwide reach. The Defense Logistics Agency's automated asset visibility system allows logistics personnel to request action in terms of nearly 230,000 requisitions and more than 11,000 contract actions a day.[6] High priority parts can be easily requisitioned and, when available, are nearly instantaneously released for shipment to the requisitioning

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[2] Defense Logistics Agency, "Defense Logistics Agency: America's Combat Logistics Support Agency," Defense Logistics Agency, http://www.dla.mil/Pages/ataglance.aspx (accessed October 12, 2011).

[3] Ibid.

[4] U.S. Joint Chiefs of Staff, *Joint Logistics,* Joint Publication 4-0 (Washington DC: Joint Chiefs of Staff, July 18, 2008), V-10.

[5] Ibid.

[6] Defense Logistics Agency, "Defense Logistics Agency: America's Combat Logistics Support Agency," Defense Logistics Agency, http://www.dla.mil/Pages/ataglance.aspx (accessed October 12, 2011).

unit. The Defense Logistics Agency maintains on hand stock for many demand based items and, although not necessarily cost effective, maintains the capability to stock inventory levels for service specified repair parts that are service defined as high cost, low demand critical capability repair parts.

Operational planners must integrate with the logistics planners to ensure that long lead time items are available. In many cases, operational planners must consider the availability of military specific requirements and ensure that logisticians know requirements well ahead of time. Although the Defense Logistics Agency stocks a great deal of materiel ready to be shipped when required, there are many other circumstances that stock posture is not available when needed. The Defense Logistics Agency does not have an endless amount of warehousing space worldwide and therefore releases performance based contracts to civilian manufacturers. This is especially important when considering spares that may be required that are high cost low demand or military specific with limited acquisition capability.

United States Transportation Command

The United States Transportation Command became the Department of Defense transportation process owner in 2003 as it answered the call of those recommending that the Department of Defense establish a critical node command responsible for the logistics and transportation support under a single commander. The United States Transportation Command is now the single entity to direct and supervise execution of the strategic distribution system and is at the heart of asset visibility by providing the requisite infrastructure long overdue to ensure inventory tracking technology better enables support on

the front lines of combat. The United States Transportation Command manages the supply chain related information technology systems, and has the authority to establish a contracting activity for procurement of commercial transportation services.[7]

The goal of United States Transportation Command is to synchronize and deliver unrivaled, full-spectrum, logistic solutions to the warfighter. United States Transportation Command makes every effort to develop and direct the joint deployment and distribution enterprise to globally project strategic national security capabilities; accurately sense the operating environment; provide end-to-end distribution process visibility; and responsive support of joint, U.S. government and Secretary of Defense-approved multinational and non-governmental logistical requirements.[8]

Similar to Defense Logistics Agency, United States Transportation Command seeks to ensure maximum asset visibility. Asset visibility allows logisticians to accurately advise commanders on the transportation status of required support often in terms of repair part asset visibility. As the distribution process owner, United States Transportation Command supports the asset visibility initiative by using radio frequency identification, automatic identification technology, and in-transit visibility. This technology is synchronized throughout the Department of Defense supply chain to maximize visibility, deployment, and distribution operational efficiencies. Automation identification technology has proven critical in the improvement of logistical support to the warfighter as commanders can now make operational decisions based on concrete knowledge of where critically needed parts are and exactly when they will be able to arrive in the operational theater thus enabling the

[7] United States Transportation Command, "What is United States Transportation Command?," United States Transportation Command, http://www.transcom.mil/about/whatIs.cfm (accessed October 12, 2011).

[8] Ibid.

informed decision of risking an operation with or without the required parts. This logistics integration support to the operational commander has the distinct possibility to save American lives; however, automation identification technology is not anticipated to be fully implemented until 2015. The vision of automation identification technology is to implement end-to-end, standard baseline automation identification technology use throughout the entire supply chain. The primary automation identification technology will be used to capture the identity of materiel or packaging at each layer of consolidation to improve operational efficiencies and provide track and trace capability within the department's supply and distribution operations. The process should be used as a blueprint to achieve seamless automation identification technology use and enable improved asset visibility.

United States Transportation Command also assesses and evaluates strategic mobility capabilities, long-range programs, requirements, and priorities. They are responsible for monitoring, assessing, and developing proactive national defense options to ensure Department of Defense strategic lift capability based on trends in the civil sector and industrial base relative to air, sea, and land transportation. Additional services provided include strategic planning, logistical transformation, force programming, policy development, and operational traffic management policies and procedures. United States Transportation Command works with the Joint Staff, Office of the Secretary of Defense, Defense Agencies, and Department of Defense field activities to improve the overall efficiency, effectiveness, and interoperability of distribution-related activities, systems and data.[9] The Policy and Doctrine division is responsible for reviewing, developing, and

[9]United States Transportation Command, "USTRANSCOM Public Command Organization," United States Transportation Command, http://www.transcom.mil/about/org/tcj5-4/cfm (accessed October 12, 2011).

implementing joint and allied doctrine as well as transportation and traffic management policies. This division engages with the joint transportation community to improve business processes for the worldwide movement of passengers, cargo, and personal property.[10]

Every day, United States Transportation Command provides transportation, sustainment and distribution to our nation's warfighters. United States Transportation Command fully supports and is on the leading edge of Department of Defense transformation efforts for a seamless, wholly integrated, synchronized end-to-end deployment and distribution system under a single unified commander providing responsive, support to the warfighter throughout the continuum of peace and war.

The ability of United States Transportation Command to support movement efforts are essential to the operational plan and must be vetted into all planning from movement to sustainment. Plans cannot simply be executed without the allocation of resources that United States Transportation Command has access to provide. Despite the extreme capability of United States Transportation Command it is undoubtedly important for logistics planners and operational planners to realize that United States Transportation Command assets support worldwide operations and in doing so have limited capability to provide support as there are only a certain number of aircraft, ships, ports, and personnel to execute planned missions. Without vetting plans through United States Transportation Command for support even the best equipped and most savvy logistics and operational planners could see a thoroughly thought out plan change due to unforeseen conditions regarding the ability of United States Transportation Command to support the fight as initially planned.

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[10] Ibid.

Logisticians are able to incorporate available tools such as the Joint Flow and Analysis System for Transportation (JFAST) to analyze available United States Transportation Command assets to people, equipment, and supplies required in a specific theater during a specific period of time. If analysis shows available assets are not available the input can be rerun against changed variables to provide the best possible solution to the operational needs of the people, equipment, and supplies. The need for integration of the joint operations planner and the joint logistics planner has deep roots in American military history. The next chapter will draw conclusions from historical examples that support the need operational and logistics planning integration.

CHAPTER 4: CONCLUSION

"You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics."

General Dwight D. Eisenhower

An analysis of two logistics dominant large-scale operations, OVERLORD and Operation IRAQI FREEDOM, reveal some common failures in the integration of operational and logistical planning across sixty years of joint warfighting experience.

As a result of President Eisenhower's recommendation to Congress, the Defense Reorganization Act was passed in 1958.[1] The Defense Reorganization Act was a transformation that moved service-centered operations toward a unity of effort. History has proven that unity of effort is not only important for services to work together, but it has also proven that joint operational planner and joint logisticians must integrate continuously throughout all steps of planning until the mission is accomplished. Without this integration, history will continue to repeat itself and unintentional gaps in operational and logistics planning will continue into the next major engagement.

Eisenhower understood that wars fought in the future would require the use of assets from multiple branches of the services acting in concert with one another. The Act gave the President the authority to establish unified commands, assign these commands missions, and determine their force structure.[2] In establishing unified commands "the Defense Reorganization Act... removed the Chief of Naval Operations (CNO) from operational control of navy fleets, although this legislation allowed the CNO to control planning

[1] Bert Chapman, *Military Doctrine: A Reference Handbook* (Denver, CO: ABC-CLIO), 48.
[2] Ibid., 48.

operations and set operational parameters for naval operations."[3] The commanders of these unified commands would be responsible for full operational control of the forces assigned to their geographic area of responsibility.

Partially in response to the problems born out of inter-service rivalries in Grenada the Goldwater-Nichols Act of 1986 was passed, requiring services to integrate recommendations through the Joint Chiefs of Staff when decisions of interest required the attention of the President, the National Security Council, or the Secretary of Defense. As the services have learned to work more effectively as a joint force, there are still areas where the joint force requires reform. The Goldwater-Nichols Act of 1986 directs that the Chairman of the Joint Chiefs of Staff is responsible for "preparing joint logistic and mobility plans to support those strategic plans and recommending the assignment of logistic and mobility responsibilities to the armed forces in accordance with those logistic and mobility plans."[4] How these joint logistics and mobility plans are prepared is entirely dependent upon collaboration with operational planners to integrate them into the strategic plan. This is not yet fully accomplished because there has not been a descriptive methodology yet established to make this legislative requirement a reality.

In order to combat the concern over the number of troops available and the concern regarding troop deployment and redeployment for Operation IRAQI FREEDOM, the Secretary of Defense, Donald Rumsfeld, took a different approach. According to Rumsfeld, modern war required a change in strategy from previous engagements. A logical sequence of alerting, mobilizing, and reading troops was used in previous engagements. Integration

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[3] Ibid., 27.

[4] Goldwater-Nichols Department of Defense Reorganization Act of 1986, Public Law 99-433, 99th Cong., 2d sess. (October 1, 1986)

shortfalls were again highlighted when the original operational planning estimates regarding fuel consumption by the Army for Operation IRAQI FREEDOM were around 40 million gallons within the first three weeks of the invasion. Logistical planners were able to determine that a pipeline from Kuwait to Udairi would be the best method for transportation to the staging area. Once the fuel reached the staging area it would be used to fill the vehicles and then loaded into tanker trucks for transport to troops at the front of the surge. Once in theater it was determined that original estimations were way lower than what was actually needed. Operational planners needed a larger number of gallons of fuel, but logistical planners were unable to meet the need due to constraints in being able to provide fuel. This is an example of how inaccurate estimations between the operational and logistics planning teams resulted in an operational level disconnect.

History has shown operational planning and logistic planning disconnects reoccur, but little has been accomplished in doctrine to doctrinally indicate how this integration is to occur. Joint Publication 5-0 highlights the steps of the planning process and Joint Publication 4-0 highlights logistics principles, but yet again there is not a bridge between the two doctrinal publications to explain how the integration is to occur and where the integration to occur. Waiting until staff estimates are built to highlight inconsistencies is far too late in the planning process when in fact the integration should occur when staffs are analyzing higher and strategic guidance.

The value of logistics can easily be underrated, and this too is emphasized when logistics was sighted as the measuring stick for any campaigns operational limits.[5] Dwight

[5] U.S. Joint Chiefs of Staff, *Doctrine for the Armed Forces of the United States*, Joint Publication 1 (Washington DC: Joint Chiefs of Staff, May 2, 2007), IV-10.

D. Eisenhower once said that "it was in his logistic inability to maintain his armies in the field that the enemy's fatal weakness lay, reinforcements failed to arrive, weapons, ammunition and food alike ran short, and the dearth of fuel caused their powers of tactical mobility to dwindle to the vanishing point."[6] The idea of collaboration is that operational planning and logistics planning are not conducted in a vacuum, but rather the thoughts, ideas, and considerations of the operational and logistics planners are articulated early and often so that all ideas and rationale are well vetted to provide a fluid and logistically executable plan.

It is abundantly clear that there is a need to integrate the principles of logistics in Joint Publication 4-0 to mission analysis and course of action development planning activities in Joint Publication 5-0. This doctrinal disconnect ultimately results in a disconnect between logistics planners and operational planners. Joint Publication 4-0 shows no way for how logistics planners are to work with operational planners. Doctrine must be combined and look the same for Joint Publication 4-0 and Joint Publication 5-0 at each key integration point. This thesis has illustrated a methodology for doing so.

Understanding how the principles of logistics contained within Joint Publication 4-0 mesh with the steps of course of action development found in Joint Publication 5-0 are the primary means to integrate logistics and operational planners. Future editions of doctrine must show how integration can occur. This lack of integration is precisely where OVERLORD and IRAQI FREEDOM planners failed and illustrate why collaboration between planning teams is vitally important.

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[6] Matthew D. Cox, "Logistics: Logistics Quotations," The WWW Virtual Library, http://www.logisticsworld.com/logistics/quotations.html (accessed October 5, 2011).

Joint Publication 4-0 provides no guidance except to follow the joint operation planning process, but does incorporate the principles of logistics. Joint Publication 5-0 has the joint operation planning process, but says nothing about logistics until the preparation of staff estimates is briefly discussed. It is then too late in the process for logistical planners to influence mission analysis or course of action development and as a result course of action development fails to adequately account for logistics considerations.

Integrating the principles of logistics found in Joint Publication 4-0 with mission analysis and course of action development found in Joint Publication 5-0 would alleviate the perception that a lack of doctrinal integration exists. Doctrinal integration would help focus and enable the logistics planning and operational planning teams to integrate early enough in the planning process. This will allow all logistics factors and conditions to be considered and analyzed. In doing so, the benefit will ultimately result in empowering logisticians to provide timely influence and integration to mission analysis and course of action development.

Future editions of Joint Publication 4-0 and Joint Publication 5-0 should have the exact same process outlines and illustrate the connection between the logistics planner and the operational planner. The logistics design serves as a recommended guide to illustrate how to integrate operational planning efforts with the principles of logistics. This recommended approach would serve to help alleviate future operational and logistical planning disconnects that current doctrine does not consider. It is essential that these planning efforts be considered throughout the planning process, vice logistics planning estimates occurring as an afterthought in the planning process.

Today, more than ever, it is time that operational planning and logistics planning doctrine integrate to explain precisely how these planning efforts will complement each other. This will ensure valuable lives are not compromised by failure to adequately integrate in the future.

APPENDIX 1

Importance of Supply Class

The order in which supplies are sent to restock or resupply troops is given priority according to "class". The depiction of classes and correlated nomenclature are listed in the below figure.

Class	Nomenclature
I	Subsistence
II	General Supplies
III	Petroleum, Oils, and Lubricants
IV	Construction
V	Ammunition
VI	Personal Items
VII	Major End Items
VIII	Medical
IX	Repair Parts
X	Non-Military

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VITA

Lieutenant Commander Capper graduated from Saint Leo University in January 2001 with a Bachelor of Arts degree in Business Administration specializing in Marketing. In 2008, he earned a Master of Arts degree specializing in Business Administration also from Saint Leo University. Keith completed Officer Candidate School in June 2001, following four years of active service as an enlisted U.S. Marine, and was subsequently temporarily assigned as the Commissioning Action Officer for the newly established Logistics Support Unit TWO at Naval Special Warfare Group TWO in September 2001. Upon completion of the Supply Officer Basic Qualification Course in Athens, Georgia, Keith was assigned as the Sales Officer, Wardroom Officer, and Hazmat Officer onboard USS KEARSARGE (LHD 3) where he earned the Surface Warfare Supply Corps Officer qualification. Following his initial tour, Keith returned to the Naval Special Warfare Community as the Supply Officer at Naval Special Warfare Group FOUR. Keith then returned to sea duty as the Supply Officer onboard the guided missile destroyer USS PORTER (DDG 78) in March 2007. Keith's Department Head tour was by all accounts exceptional. He led the Supply Department in earning the Blue "E" for Supply Excellence and was a part of the Battle "E" winning unit from COMDESRON 2. Personal achievements earned while serving onboard PORTER included the SURFLANT Logistics Award presented by football Hall of Famer Mr. Mike Ditka and the 2008 Vice Admiral Batchelder award. Keith was then assigned to U.S. Fleet Forces Command where he was instrumental in the stand up and development of the Ballistic Missile Defense concept soon to be deployed. Keith is married to the former Christina L. Farkas and together they have two sons, Hayden and Peyton.